

REMARKS

Summary

Amended independent Claims 1, 15, 23, 27, and 52 are understood to recite at least one feature not disclosed or suggested by the cited art. In addition, combining the art as suggested is understood to render the resulting device inoperable. Therefore, a prima facie case of obviousness is not understood to be able to be established under MPEP § 2142, § 2143.01, and § 2143.02 for amended Claims 1, 15, 23, 27, and 52.

Status of the Claims

Claims 1-8, 11-18, 21, 23-30, 52, and 53 are pending. Claims 9, 10, 19, 20, and 22 have been canceled without prejudice. Claims 1-3, 11, 15-18, 21, 23-30 and 52 have been amended. Support for these amendments can be found at least in Example 1 discussed at page 10, line 10 through page 12, line 17, and in Figure 1-3. Applicant submits that no new matter is added by these amendments. Claims 1, 15, 23, 27, and 52 are independent.

Requested Action

Applicant respectfully requests reconsideration and withdrawal of the outstanding rejections in view of the foregoing amendments and the following remarks.

Rejections

Claims 1-3, 9, 15, and 19 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,430,298 (Possin et al.) in view of U.S. Patent No. 5,793,047 (Kobayashi et al.). Claims 4-8, 12-14, 16-18, and 22-30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the patent to Possin et al. in view of the patent to Kobayashi et al. and U.S. Patent No. 6,271,525 (Majewski et al.). Claims 10, 11, 20, and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the patent to Possin et al. in view of the patent to Kobayashi et al. and U.S. Patent No. 4,011,454 (Lubowski et al.). Claims 52 and 53 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Possin et al. patent in view of the patent to Kobayashi et al. and U.S. Patent No. 5,700,333 (Yamazaki et al.).

Response to Rejections

In response, while not conceding the propriety of the rejections, independent Claims 1, 15, 23, 27, and 52 have been amended. Applicant submits that as amended, these claims are allowable for the following reasons.

Amended independent Claim 1 relates to an image pick-up apparatus comprising a plurality of pixels, a wavelength converter, a protective layer, and a flattening layer. Each pixel includes a photoelectric conversion element and a switching element, arranged on an insulating substrate. The wavelength converter is configured and positioned to convert incident radiation to light having a wavelength detectable by at least one of the photoelectric conversion elements. The protective layer is arranged on the insulating substrate so as to cover the plurality of pixels. The flattening layer is arranged at least on the plurality of pixels so as to be positioned upon a

surface of the protective layer. The wavelength converter is arranged by being deposited on the flattening layer and comprises a scintillator which comprises a columnar crystal. The plurality of pixels, the protective layer, and the flattening layer are situated between the insulating substrate and the wavelength converter.

By this arrangement, when a PIN type photodiode and a TFT are formed on an insulating substrate, causing a large step at the boundary therebetween, the columnar crystal formed at the large step is not distorted, as discussed at page 8, line 20 through page 9, line 11 of the specification. In previously-developed devices, on the other hand, the columnar crystal was distorted at the step, leading to an undesirable decrease in the aperture ratio.

In contrast, the patents to Possin et al., Kobayashi et al., Majewski et al., and Yamazaki et al. are not understood to recognize that when a PIN type photodiode and a TFT are formed on an insulating substrate, causing a large step at the boundary therebetween, the columnar crystal formed at the large step becomes distorted. Nor are these citations understood to propose a solution to this unrecognized problem, i.e., by situating a plurality of pixels, a protective layer, and a flattening layer between an insulating substrate and a wavelength converter, as recited by amended Claim 1. This lack of disclosure of at least one feature of amended Claim 1 proves fatal to establishing a prima facie case of obviousness against Claim 1 since MPEP § 2142 requires the cited art to disclose or suggest all the claimed features to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests that the rejection of Claim 1 be withdrawn.

MPEP § 2142 also requires that there “be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art,

to modify the reference or to combine reference teachings”. And MPEP § 2143.01 further explains that the necessary motivation to combine cannot be found where the proposed modification renders the device being modified unsatisfactory for its intended purpose. Here, the modification suggested in the Office Action involves changing of the electrically conductive back contact layer 138 of the Possin et al. patent (identified by the Office Action as corresponding to the claimed substrate) to an insulating layer. But such a modification is understood to render the Possin et al. device inoperative and therefore, unsatisfactory for its intended purpose, because the layer 138 would not be able to apply a bias voltage to the photodiodes 124 (as discussed at column 4, lines 25-30 of this patent). Therefore, the Office is not understood to have satisfied the motivation-to-combine criteria of MPEP § 2143.01.

For this additional reason, the Patent Office is not understood to have established a prima facie case of obviousness against amended Claim 1 over this art. Accordingly, Applicant respectfully requests that the rejection of Claim 1 be withdrawn for this additional reason.

MPEP § 2142 further requires that there be a reasonable expectation of success when modifying the art to produce the claimed invention. But, here, as noted above, changing the electrically conductive back contact layer 138 to an insulating layer, would render the Possin et al. device inoperable because the layer 138 could no longer apply a bias voltage to the photodiodes 124. Thus, the Patent Office is not understood to have established a reasonable expectation of success in modifying the Possin et al. patent to produce the invention of amended Claim 1, as also required by MPEP § 2142.

For this third reason, the Patent Office is not understood to have established a prima facie case of obviousness against amended Claim 1 over this art. Accordingly, Applicant respectfully requests that the rejection of Claim 1 be withdrawn for this additional reason.

Since independent Claims 15, 23, 27, and 52 have been amended in a manner similar to Claim 1, they are allowable for similar reasons.

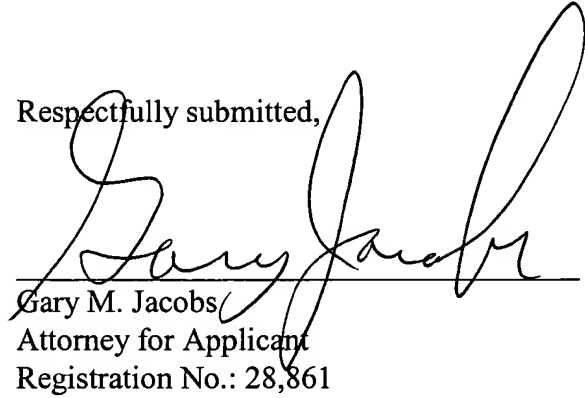
The dependent claims are allowable for the reasons given for the independent claims and because they recite features that are patentable in their own right. Individual consideration of the dependent claims is respectfully solicited.

Conclusion

In view of the above amendments and remarks, the application is now in allowable form. Therefore, early passage to issue is respectfully solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gary Jacobs", is written over a horizontal line. The signature is fluid and cursive.

Gary M. Jacobs/
Attorney for Applicant
Registration No.: 28,861

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200
GMJ:ayr

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